Welcome!

- **You are in the Waiting Room for the Baird & McGuire Superfund Site February 2021 Update**
- **We will start the meeting shortly after 6:30pm, and let you into the main meeting room at that time**
- **For audio, we encourage you to select either the "Computer Audio" or "Call Me" option.**
  - If you select the "Phone Call" option for audio, please enter your "Participant ID" when prompted. This will help us ensure you have a smooth meeting experience.

Baird & McGuire Superfund Site

February 2021 Update

Meeting Goals

- **Follow-up from the October 2019, Five Year Review Meeting**
- **Share background information on the status and future of the site, recent investigations, and upcoming pilot test**
- **Learn about and respond to community questions and concerns about the site**

Welcome & Introductions

ZaNetta Purnell, EPA
Community Involvement Coordinator

Kimberly White, EPA
Project Manager

Dorothy Allen, MassDEP
Project Manager

Toby Berkman, CBI *(EPA contractor),* Facilitator

Paul Feshbach-Meriney, Parsons *(MassDEP contractor)*

Glenn Ulrich, Parsons

Julien Chambert, Parsons

Agenda

- Report on Community Concerns
- Site Background & Remedies
- Question and Answer (Q&A)
- Recent Investigations
- Breakout and Q&A Session
- Planned Pilot Test
- Next Steps
- Q&A

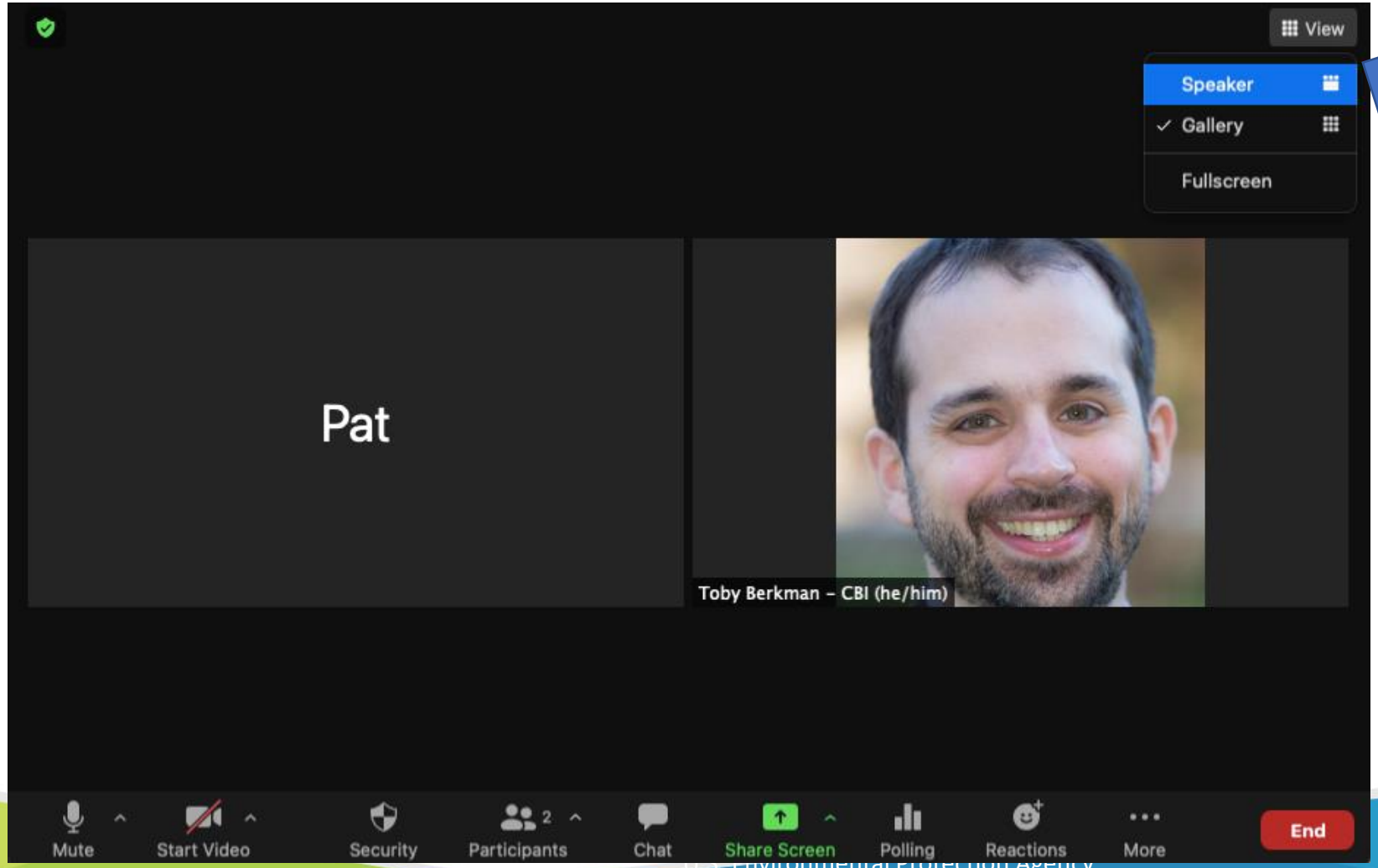
Ground Rules for Online Participation

Our requests:

- **Keep your microphone muted when not speaking**
- **Respect time limits for questions and comments**
- **Keep comments and chats respectful and appropriate for a public audience**
- **Follow the facilitators' guidance and instructions on how to participate**

Using Zoom: Desktop App

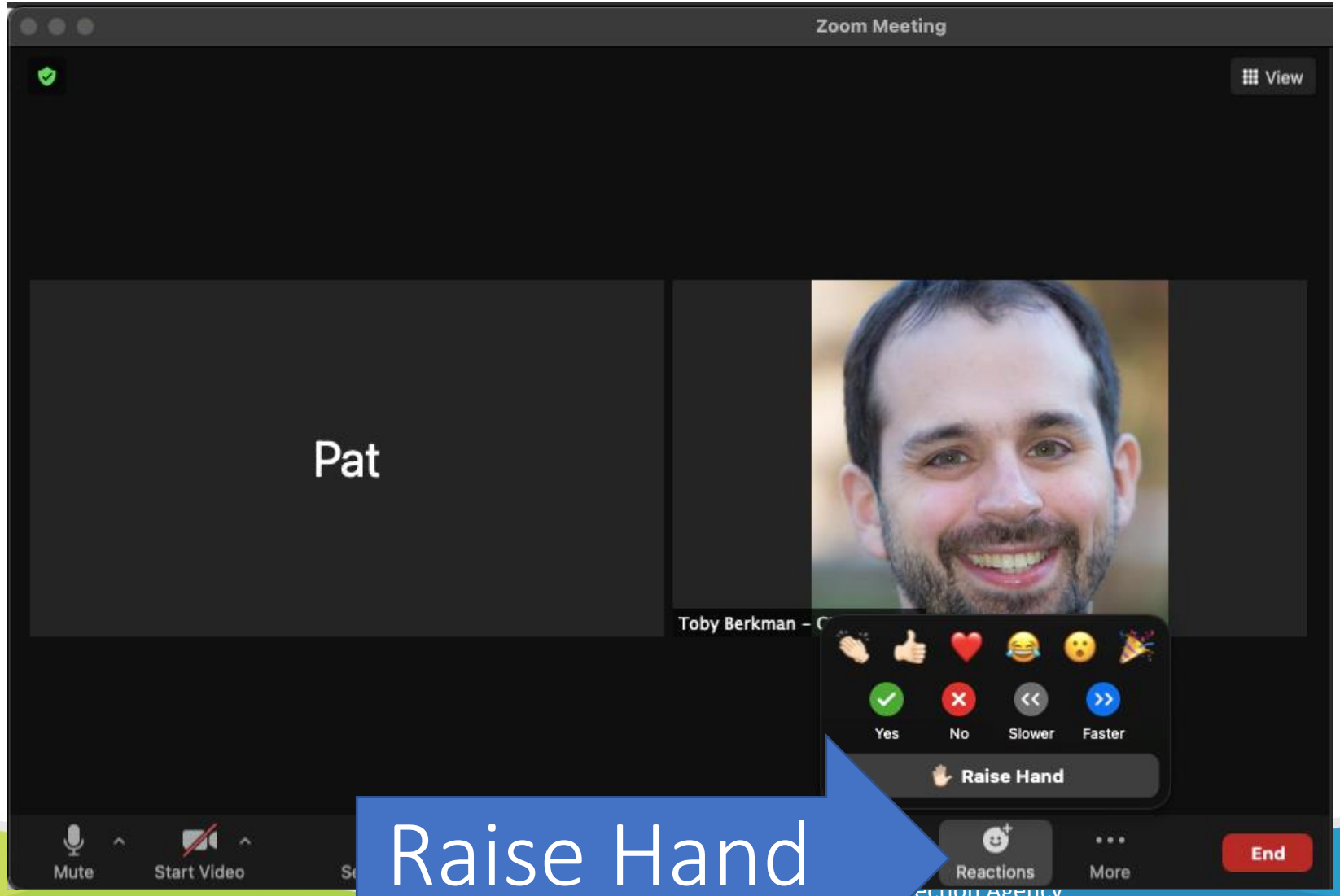
Using Zoom: Desktop App



Change View

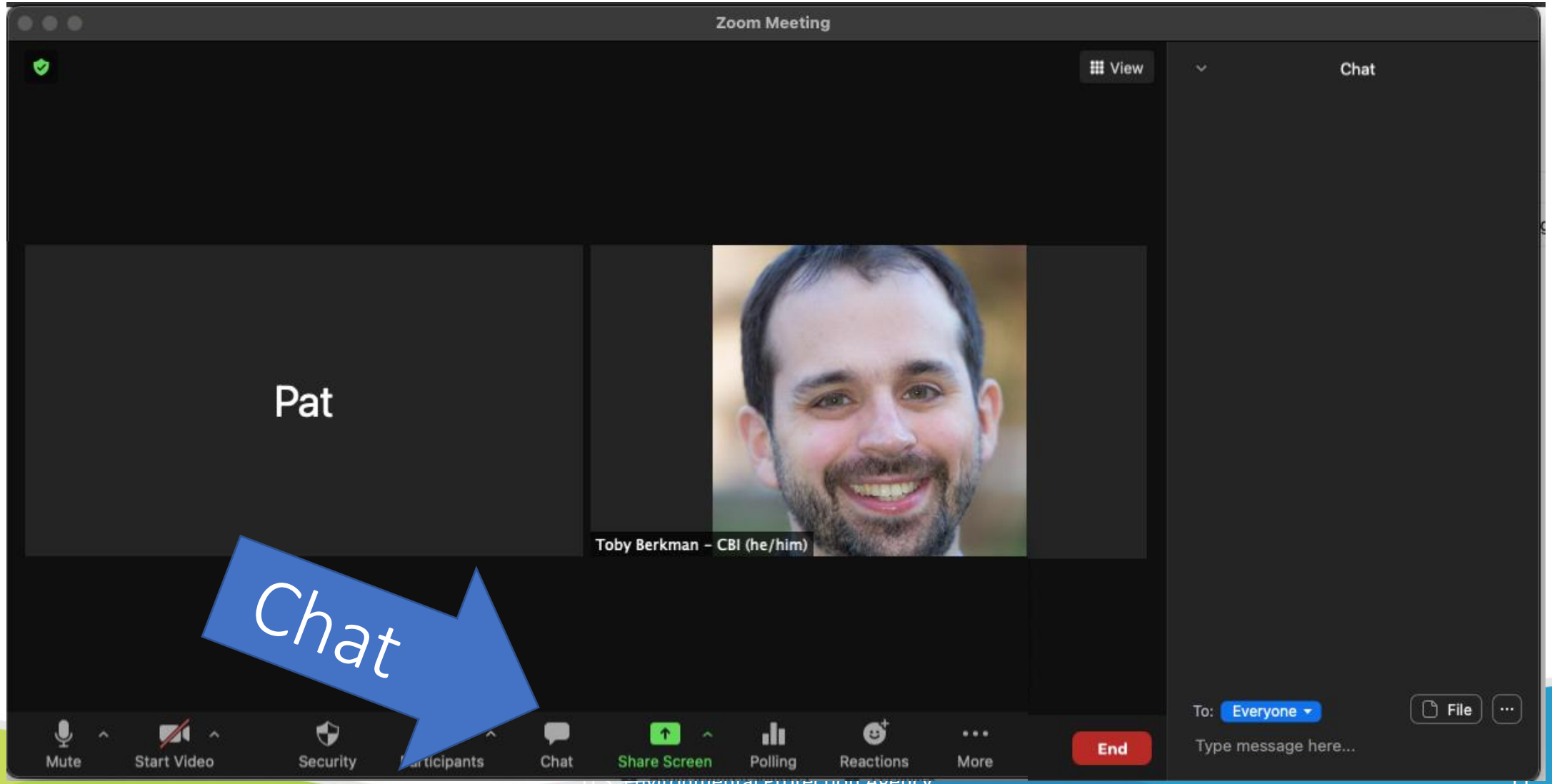
Using Zoom: Desktop App

Using Zoom: Desktop App



Raise Hand

Using Zoom: Desktop App



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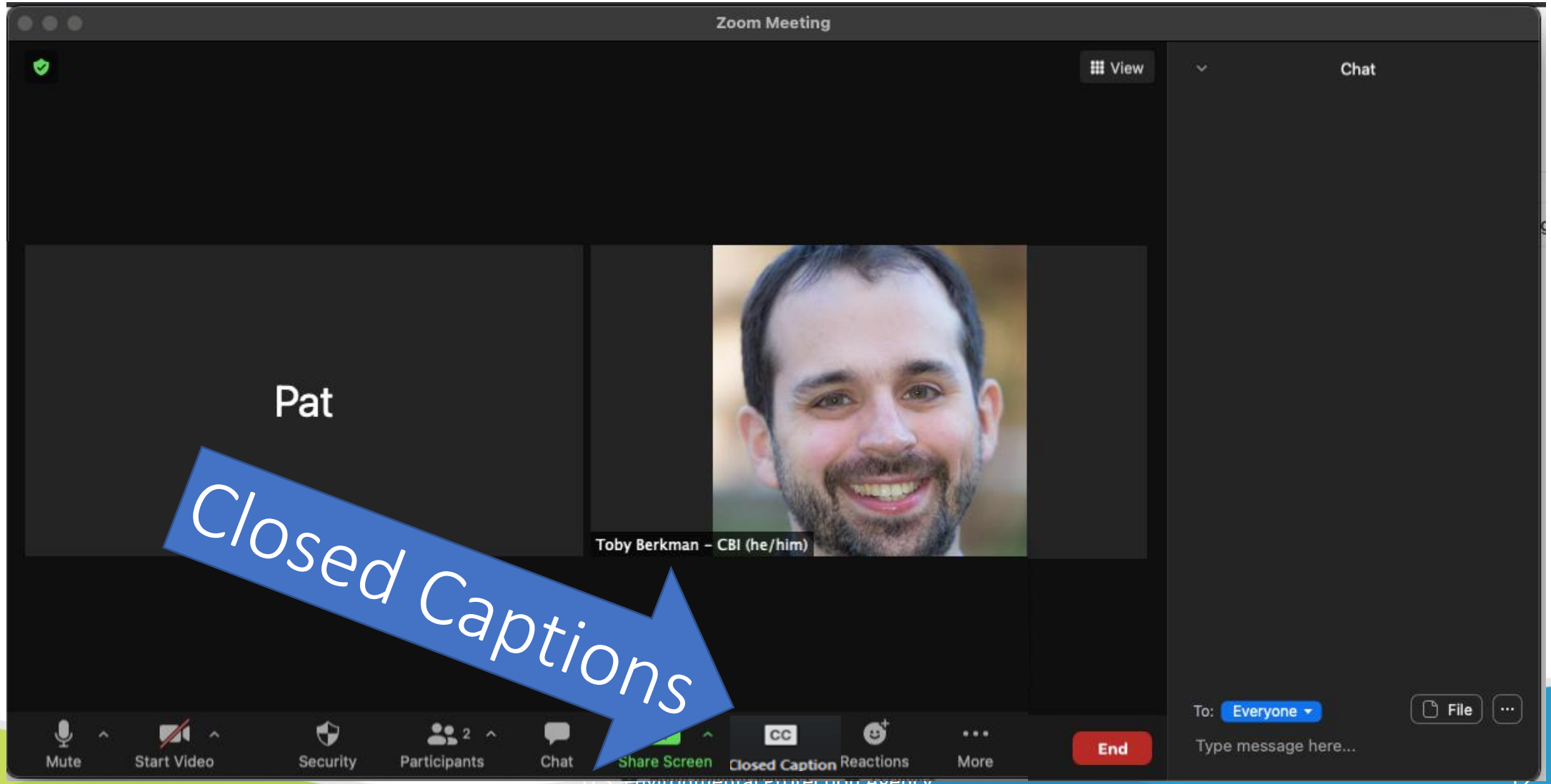
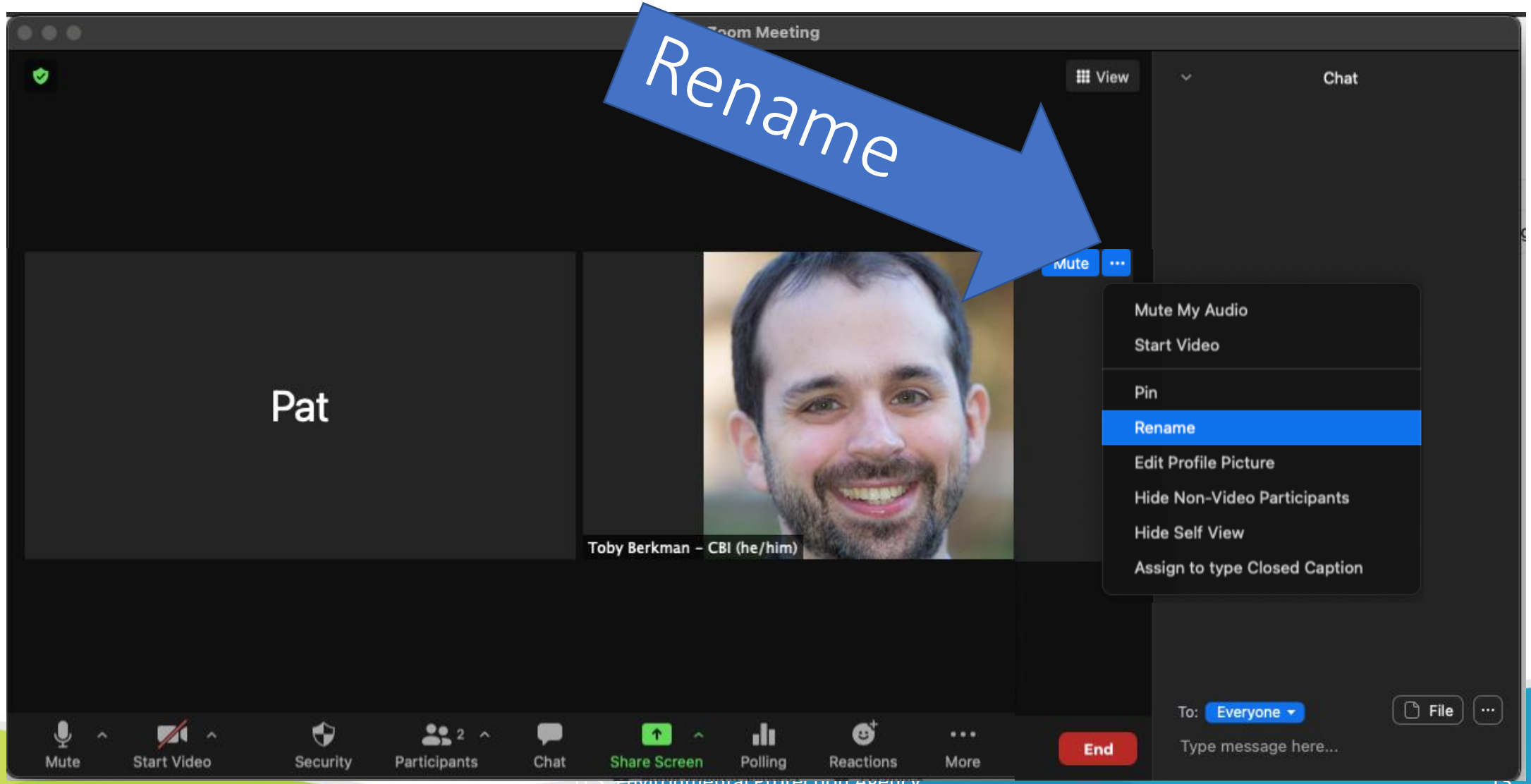
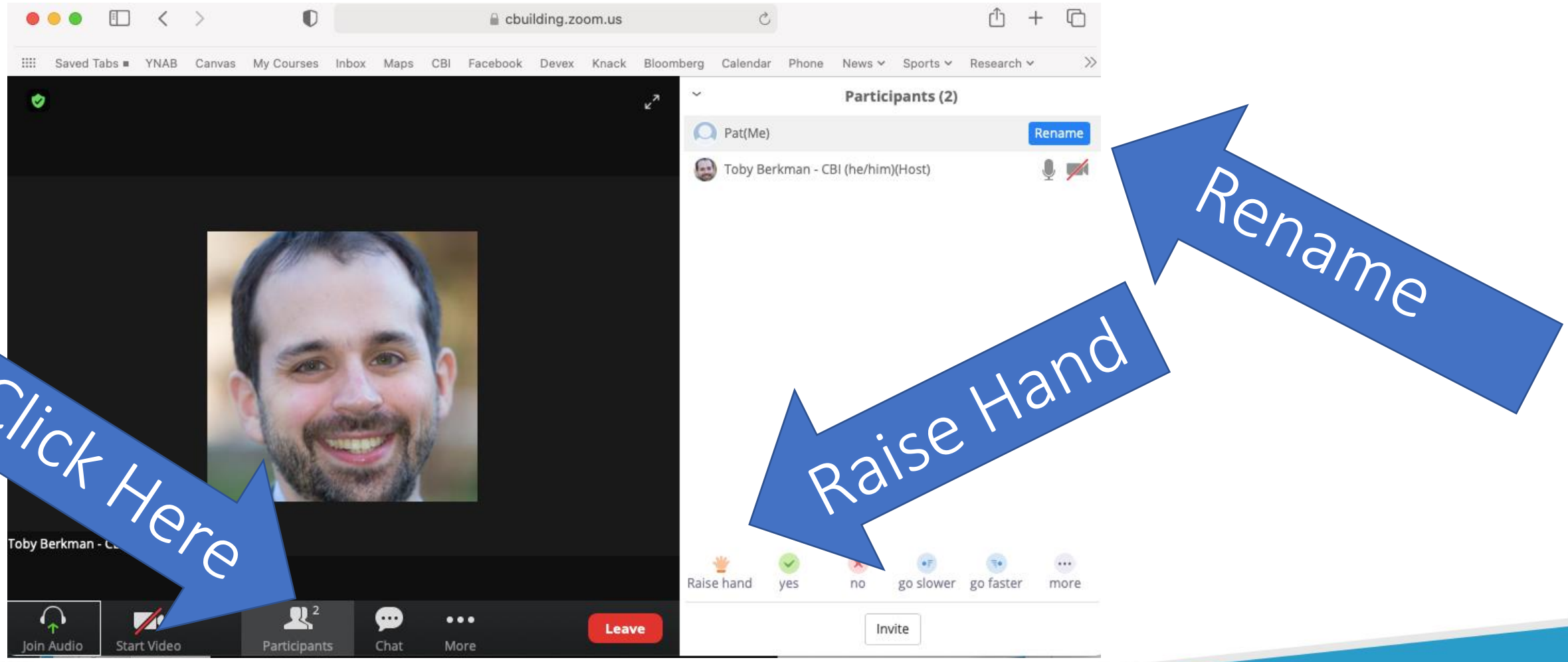


Using Zoom: Desktop App



Using Zoom: Browser App



Using Zoom by Phone

- **Key commands**
  - **Mute/unmute: *6**
  - **Raise hand: *9**

Report on Community Concerns

Goal:

- **Learn about community perspectives and concerns on the Baird & McGuire site, to inform agency plans on how to engage with the community moving forward.**

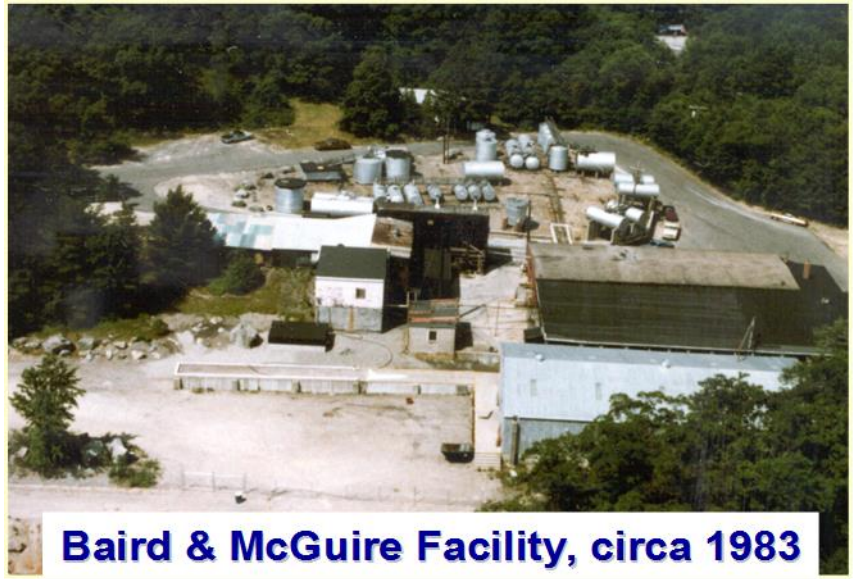
Approach:

- **Online survey on community interests and concerns**
  - >400 responses
- **In-depth interviews with 20 residents**
  - Long-term and newer area residents
  - Town officials and representatives
  - Local business and property owners

Community Assessment: Findings

- **Very difficult history**
- **Lack of trust**
- **Continued health concerns**
  - Range from very serious to everyday
- **Renewed attention due to TLA-Holbrook controversy**
- **Questions/concerns around cleanup pace**
- **Want land protected from future disturbance/re-use**
- **Environmental Justice concerns among Randolph community**
- **Interest in active, transparent engagement from EPA/DEP moving forward**

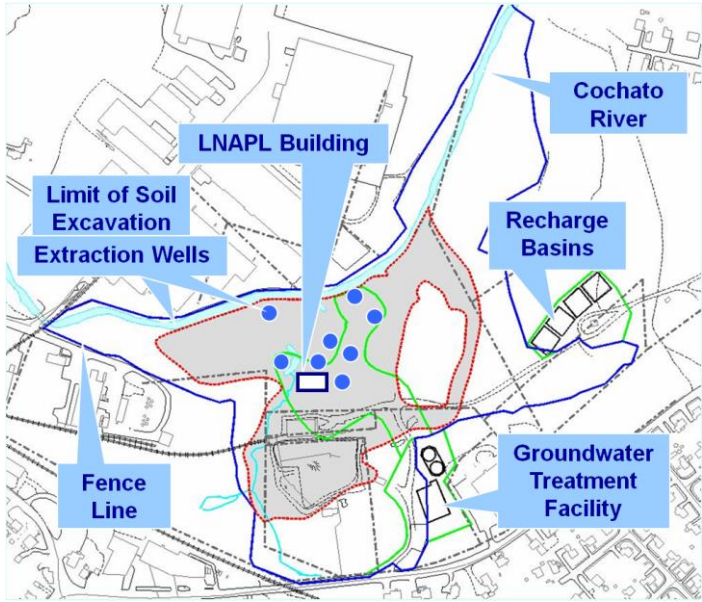
Site Background


Baird & McGuire Facility, circa 1983

- **Former chemical manufacturing facility**
  - 32 Acres, located in Holbrook, MA - along Cochato River
  - Operated from 1912 to 1983 (70 years)
  - Manufactured herbicides, pesticides, disinfectants, soaps, floor waxes and solvents
  - Well-field near site
    - Closed: well #1 in 1959 (closest to the site, not operated long); well #2 in 1980; well #3 in 1982
- **Listed on EPA's list of hazardous waste sites (National Priority List) in 1983**
  - Soil, groundwater, sediment contaminated with:
    - *Light Non-Aqueous Phase Liquids (LNAPL), Semi-volatile Organic Compounds (SVOCs), Volatile Organic Compounds (VOCs); Pesticides: Chlordane & DDT; Metals: Arsenic & Lead*
  - Fenced placed around the site to reduce exposure
  - Interim actions taken to control source (i.e., tanks, drums, lagoons & building) and to control releases from groundwater to river

1986 & 1989 Clean-up Decisions Objectives

- **Minimize the human health risk from direct contact with contaminated soils/sediments;**
  - Excavated soils from “hot areas” and burned them to destroy contaminants; 248,000cy of residual ash buried on site (completed from 1995 - 97)
  - *Residual contamination remains under layer of clean fill that does not pose a risk*
- **Protect surface waters from future contaminant migration**
  - Dredged sediment near site and placed a cap near the site (completed from 1994 – 95)
  - Active recovery residual light oily substance (LNAPL) (1999 – 2009)
  - *Surface water concentrations are below risk levels for site contaminants*



1986 & 1989 Clean-up Decisions Objectives (cont'd)

- **Remediate the contaminated groundwater within a reasonable time period;**
  - Treatment Facility – started 1993; transferred to DEP in 2004 *(on-going)*
  - Clean-up level set to Federal safe drinking water standard
    - Maximum Contaminant Levels (MCLs)
  - *Reassessment of treatment and clean-up levels is necessary (not complete)*
    - Clean-up levels were temporary levels and did not consider the effectiveness of treatment
- **Minimize long-term damage and/or maintenance requirement**
  - Evaluate long-term effects through Monitoring *(on-going)*
    - Fish, Sediment, Groundwater and Treatment Facility
    - Monitoring Reports are available on EPA's website: www.epa.gov/superfund/baird
  - *More maintenance is required because of the age of the equipment*

1990 Clean-up Decisions Objectives and 2003 & 2005 Changes

- **Establish Alternative Municipal Water Supply**
  - Closed well field near the Site *(completed in 1982)*
  - Expanded Upper Reservoir/Great Pond to replace lost water supply *(completed 2001)*
  - No further action
- **Incorporate Institutional Controls (ICs)**
  - Legal, enforceable restriction recorded with deed for a property
    - Notice of Activity and Use Limitation (NAUL) – more on next slide
    - 11 properties in and around BM site *(completed 2018)*
  - Properties reviewed for compliance

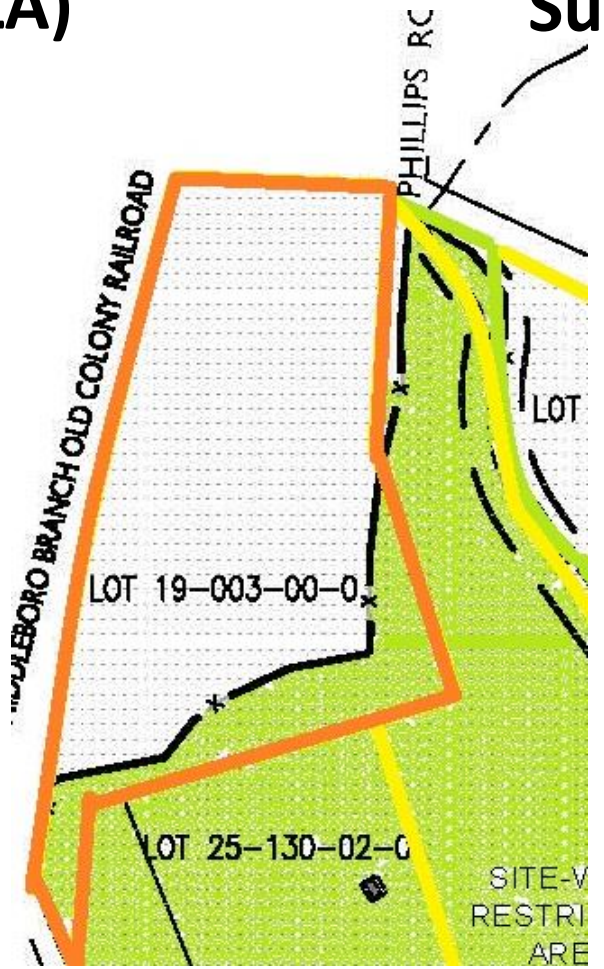
Institutional Controls

- **Maintain land uses as commercial**
  - Based on risk evaluation
- **Ensure GW is not affected**
- **Prevent any unintended exposure to remaining soil contamination**
  - Excavation in contaminated areas of Site
- **Requires owners to submit relevant documentation**
  - Before taking actions at Site

Institutional Controls Example and Superfund's Role

Waste Transfer Station (TLA)

- **1, 3, and 6 Phillips Road in Holbrook, MA**
  - NAULs on 3 & 6 Phillips Rd
- **Solid Waste Department for MassDEP provides permit approvals**
  - EPA not authorized by law
- **Portions of Railroad planned for fenced area**
  - No plans submitted



Superfund's (EPA& MassDEP's) role

- **Ensure requirements of NAULs are meet**
  - Review submittals
- **Determine if:**
  - risk to exposure to site soils
  - impact to groundwater
- **Inform property owner (Town of Holbrook) decision**
  - work with Town to make this public

More information about TLA can be found at: https://www.holbrookma.gov/board-health/pages/link-tla

On-Going Monitoring

- **EPA conducts Five-Year Reviews**
  - Evaluate the implementation and performance of the remedy
  - Provides an update to community
  - EPA website: https://semspub.epa.gov/work/01/100012014.pdf
- **DEP continues Operating the Treatment Facility**
- **DEP continues Monitoring Groundwater and the Cochato River**

Groundwater Treatment

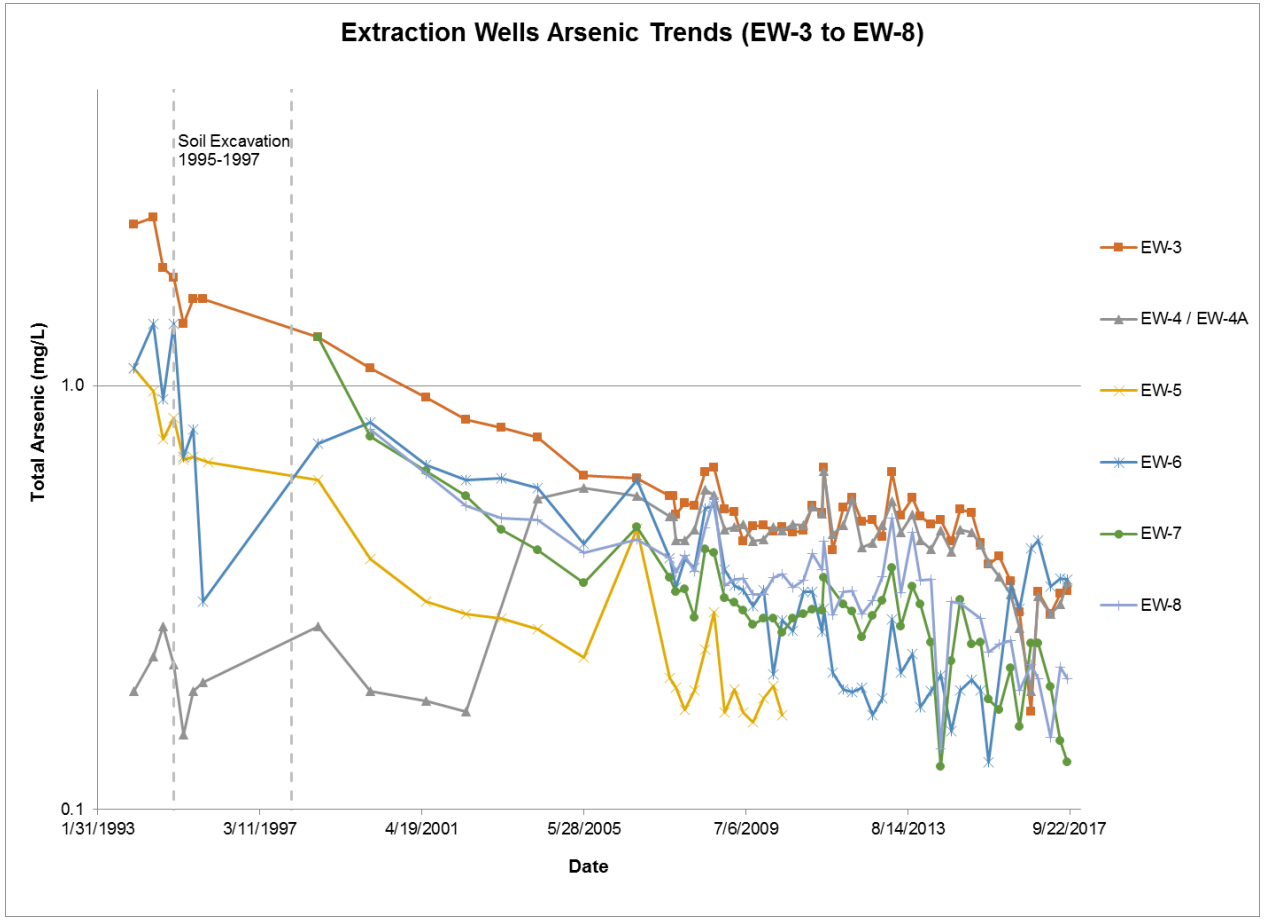
- **Pump & Treat System is operating and effective**
  - *Treatment plant precipitates and adsorbs contaminants from groundwater*
  - *Solids containing arsenic and organics are removed off-site as sludge and as spent filter media*
  - *Clean groundwater is pumped into infiltration basins*
- **Improvements and maintenance are performed:**
  - *Treatment System is regularly maintained, including:*
    - *Repairing, replacing & relocating extraction wells*
    - *Replacing, pumps and tank components*
    - *Reconfiguring plant flows for water use efficiency*
  - *Energy efficiency upgrades are implemented, VFD and lights*
    - *Evaluated the use of combined heat and power and solar power generation technology*

Groundwater Monitoring

- **Site Monitoring (quarterly and annually)**
  - Evaluate On-site Groundwater Contamination
    to determine progress of clean-up
  - Evaluate groundwater movement
    to determine potential transport of contaminants to Cochato

- **Treatment Plant Monitoring (daily and weekly)**
  - Evaluate flows and contaminants into the plant from extraction wells
  - Evaluate flows and contaminants through the plant to monitor plant operations
  - Evaluate flows and contaminants to the infiltration basins
- **Treatment Plant is over 25 years in continual operation**
  - Facility is past its useful life
  - Based on recommendations from a 2013 EPA Optimization Review
    the facility needs continuous investment to operate

Contamination Decreasing



Arsenic rapidly decreased in the groundwater in the first ten years.

In the next ten years removal has stabilized and reduction of arsenic concentrations in groundwater are not decreasing.

Treatment plant removes about 100 pounds of arsenic per year.

Cochato River Monitoring

- **Sediment and Fish Tissue is Monitored Every 5 Years**
  - Sediment concentrations of Arsenic, PAH & pesticides are below dermal (skin) contact risk levels established for the site
  - Concentrations are lower than before river clean up and now are slowly decreasing
  - Fish tissue contains site contaminants – no site- specific risk levels were established
- **Fish signage is maintained near Cochato River**
  - result of statewide fish consumption ban due to Mercury contamination from use of coal combustion for power generation
- **Surface water in Cochato River is below MCLs and AWQC**

Optimization Review Recommendations Performed by MassDEP (Parsons)

- **Investigate soil, groundwater and LNAPL – *completed***
  - Locate Arsenic and Characterize LNAPL
  - Update the Conceptual Site Model (CSM)
    - CSM = describes the location of contaminants and how groundwater interacts with residual LNAPL and contaminated soils
- **Evaluate Improving or replacing existing treatment plant with new in-situ treatment technologies**
  - Bench-Scale Studies performed to evaluate in-situ treatment options - *completed*
  - In-situ Pilot Tests will be performed in the spring of 2021 – *not completed*
- **EPA will utilize the data from Pilot Tests to determine next steps – *not completed***
  - Change/confirm interim clean-up levels

Question & Answer

Q&A: How to Participate Via Zoom

- **Raise your "virtual" hand to get in the speaking queue**
- **You can also type questions via chat**
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Recent Investigations

Conceptual Site Model Update

Baird & McGuire Superfund Site

Paul Feshbach-Meriney

PARSONS

Recent Investigations: What does Site look like today?

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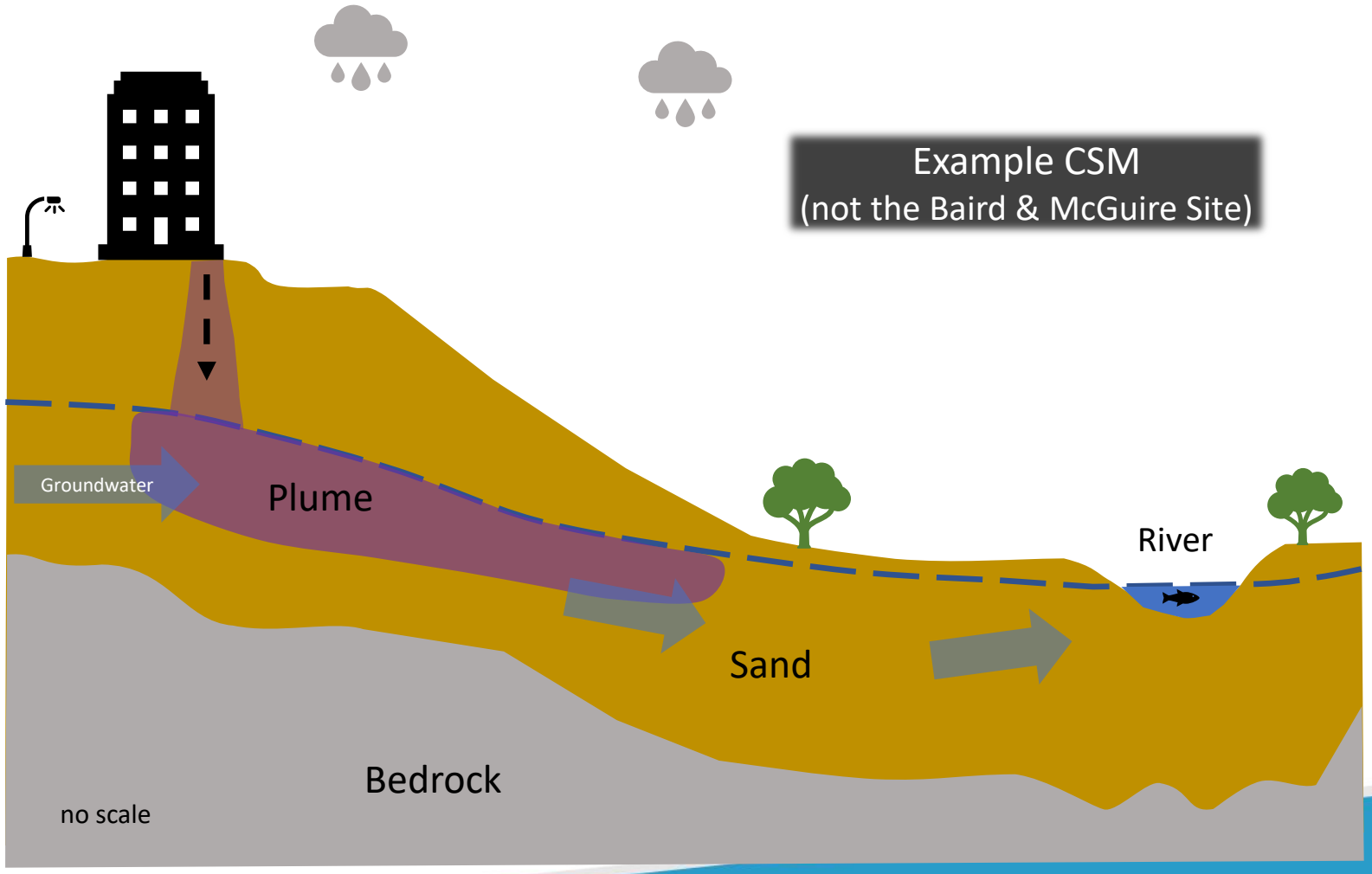
Recent Investigations: What does Site look like today?

Recent Investigations: What is a Conceptual Site Model (CSM)?

Platform for evaluating the data gaps and related uncertainty associated with…

Example CSM
(not the Baird & McGuire Site)

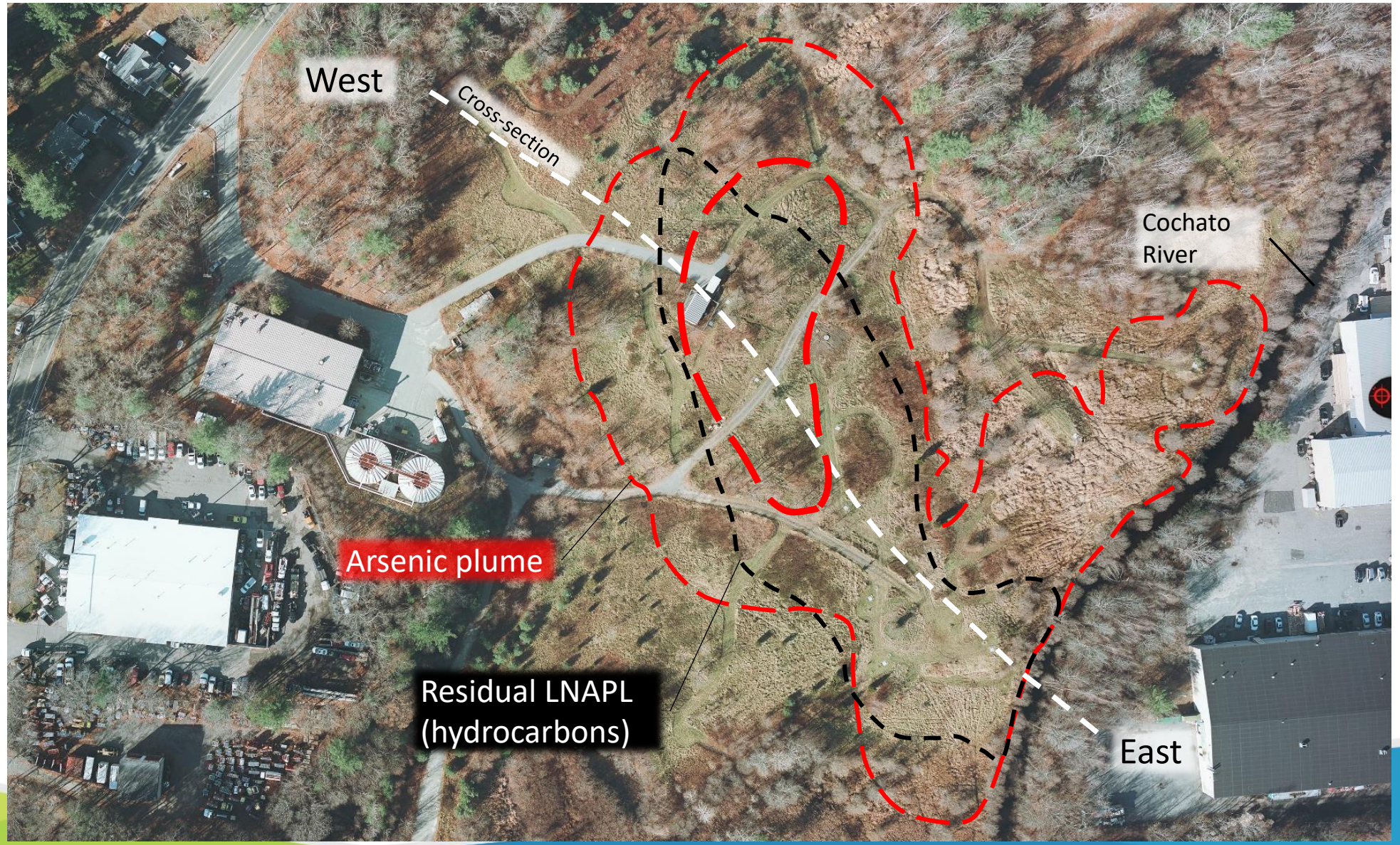


Recent Investigations: Why was an Updated CSM Needed?

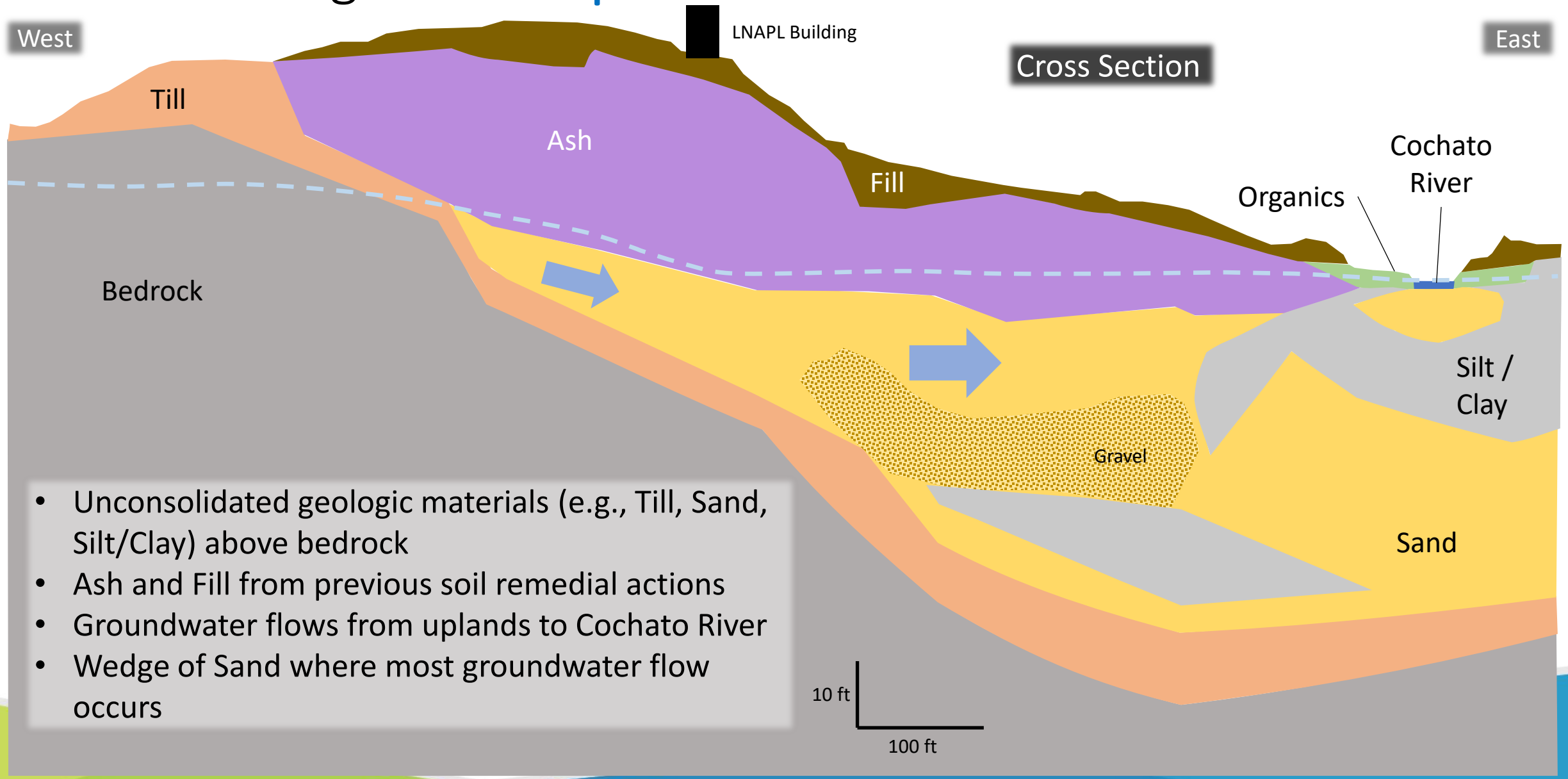
- **Groundwater extraction remedy needs to be in place for a very long time (~100+ years)**
- **CSM was outdated**
- **New investigation techniques / testing**
- **Reduce cleanup time for groundwater**

High Resolution Vertical Profiling

Recent Investigations: Updated CSM for Baird & McGuire Site

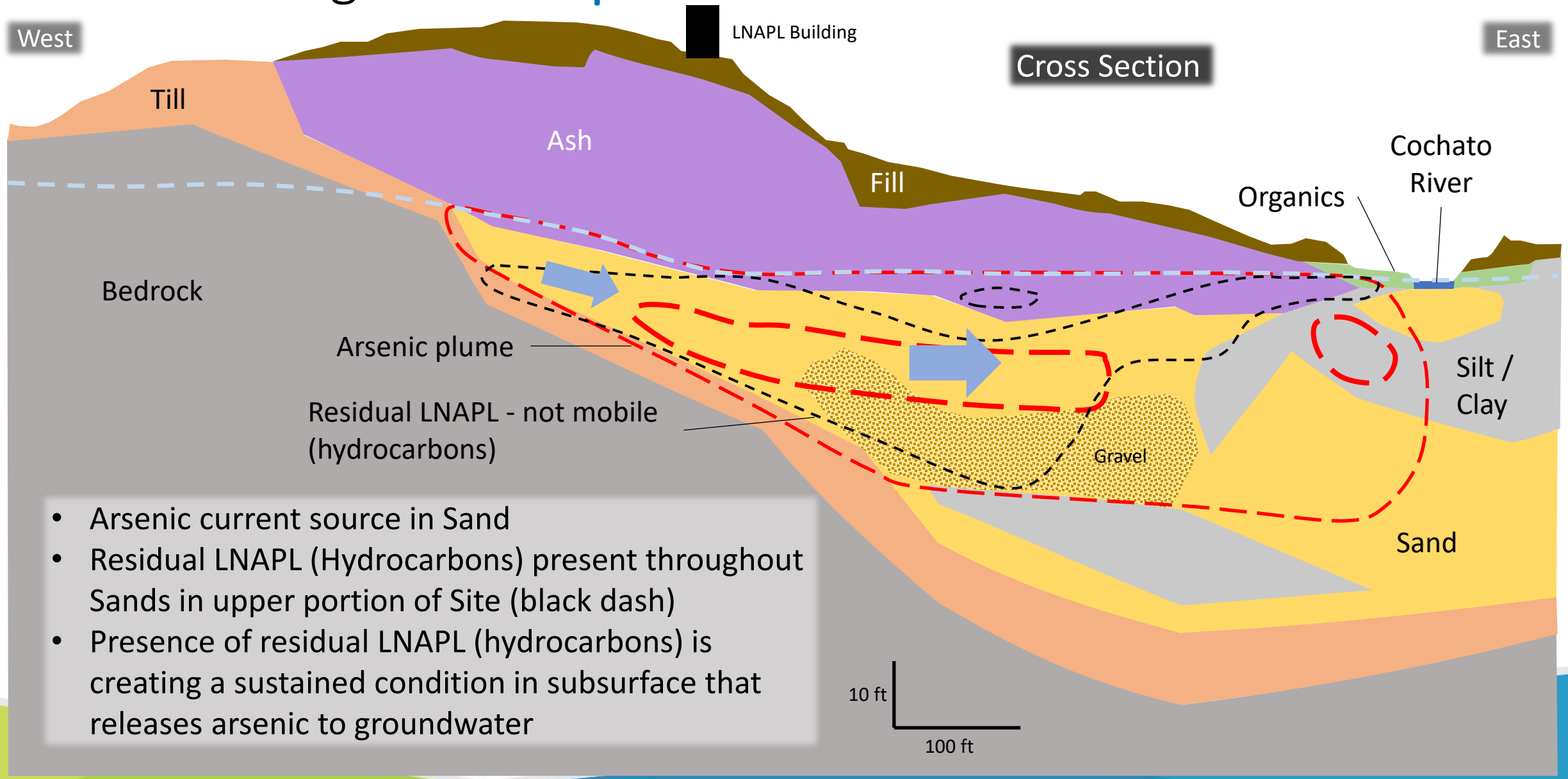


Recent Investigations: Updated CSM for Baird & McGuire Site



- Unconsolidated geologic materials (e.g., Till, Sand, Silt/Clay) above bedrock
- Ash and Fill from previous soil remedial actions
- Groundwater flows from uplands to Cochato River
- Wedge of Sand where most groundwater flow occurs

Recent Investigations: Updated CSM for Baird & McGuire Site



- Arsenic current source in Sand
- Residual LNAPL (Hydrocarbons) present throughout Sands in upper portion of Site (black dash)
- Presence of residual LNAPL (hydrocarbons) is creating a sustained condition in subsurface that releases arsenic to groundwater

Recent Investigations: Treatability Studies

- **Studies that evaluate the effectiveness of various treatments to reduce contamination**
- **Tested alternative technologies (not pumping) in the laboratory to address arsenic and hydrocarbons in groundwater at Baird & McGuire**
- **Treatments with positive results included:**
  - Sulfate
  - Nitrate
- **Treatments often tested in the field on a larger (pilot) scale**

Treatability Testing

Recent Investigations: CSM / Treatability Take-Aways

- **We know where the arsenic and residual LNAPL (hydrocarbons) are in the subsurface soil and groundwater**
- **We know current source of arsenic is in Sands and how it's entering groundwater.**
  - Co-occurrence of arsenic source and residual LNAPL (hydrocarbons) in Sands is creating a sustained chemical condition that releases arsenic to groundwater
- **We identified sulfate and nitrate treatments as effective alternative technologies for remediating arsenic and hydrocarbons in groundwater**
- **Treatments will be evaluated in pilot tests**

Breakout Session

Breakout Groups

- **Your task: *Identify key questions your group would like to ask the presenters or agencies.***
  - Questions can relate to recent investigations, or other issues more broadly
- **Guidance:**
  - Introduce yourselves: *Who are you and where do you live?*
  - Share: *What are key questions you want to ask?*
  - Decide: *As a group identify two or three key questions and nominate someone in your group who will ask them once we return to the large group.*
  - Record*: Once back in plenary, the reporter from your group should enter those questions in the chat if the agencies do not get to them in the Q&A to ensure they are captured*

Group Questions & Answers

Pilot Test

Baird & McGuire Superfund Site

Glenn Ulrich & Julien Chambert

PARSONS

Pilot Test: Presentation Contents

- **Purpose of the Pilot test**
- **Pre-Pilot Groundwater Monitoring (Completed)**
- **Summary of Proposed Pilot Test (Approach and Monitoring)**

Pilot Test: Why conduct a pilot test?

- **Pilot Test – Test of a technology to treat contaminants in the field**
- **Important to test chemical reactions seen in the laboratory on a field-scale at Baird & McGuire**
- **Why are we doing a pilot test for an alternative remedy? To reduce the remediation time**

Groundwater Extraction / Treatment

In-Situ Treatment

Pilot Test: Existing Remedy vs Proposed Pilot Tests

EXISTING:

Groundwater Extraction / Treatment

- Pumping groundwater
- Plume capture/containment
- Above ground treatment (GWTP)
- Discharge of treated groundwater

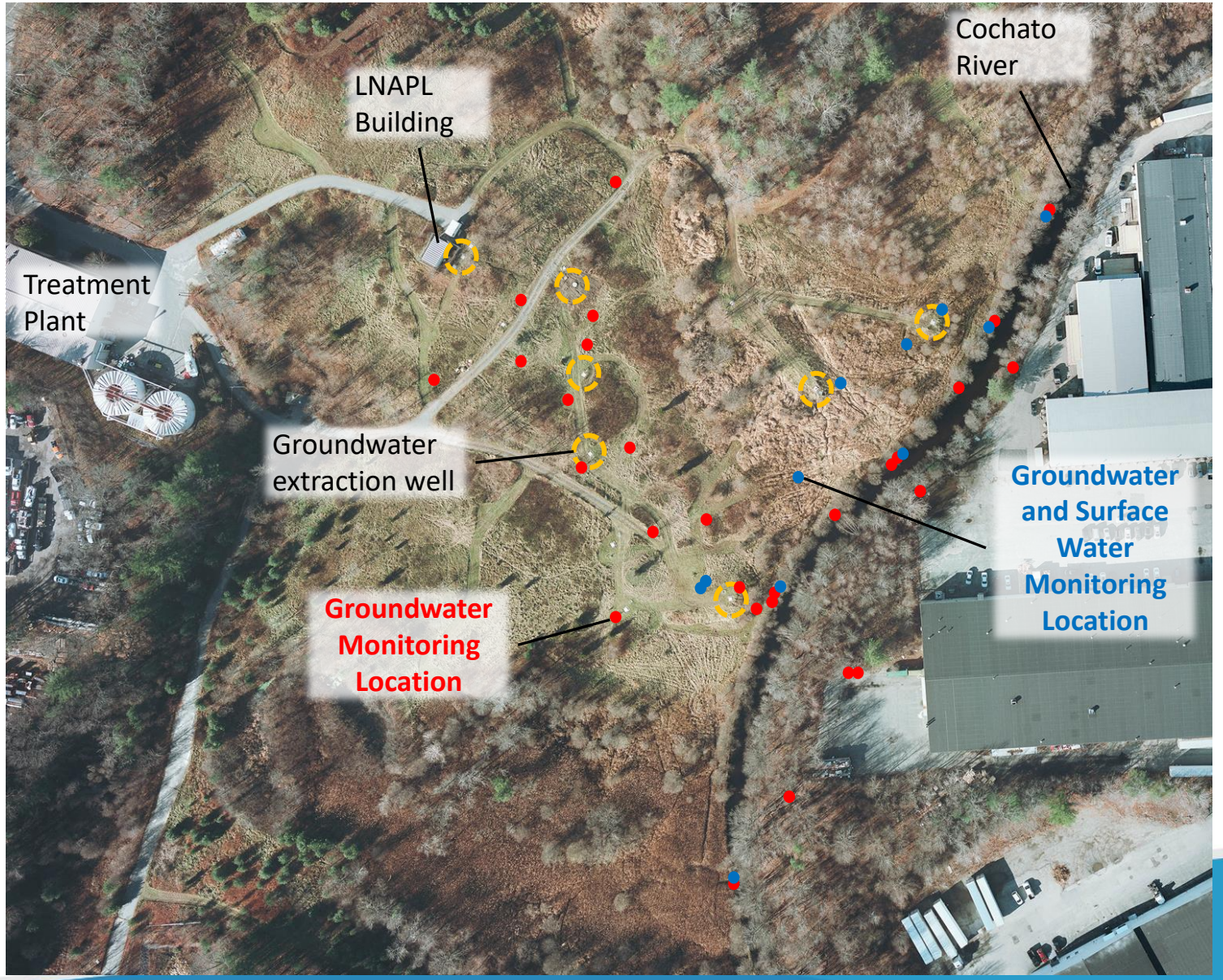
PROPOSED PILOT TESTS:

Injection / Treatment

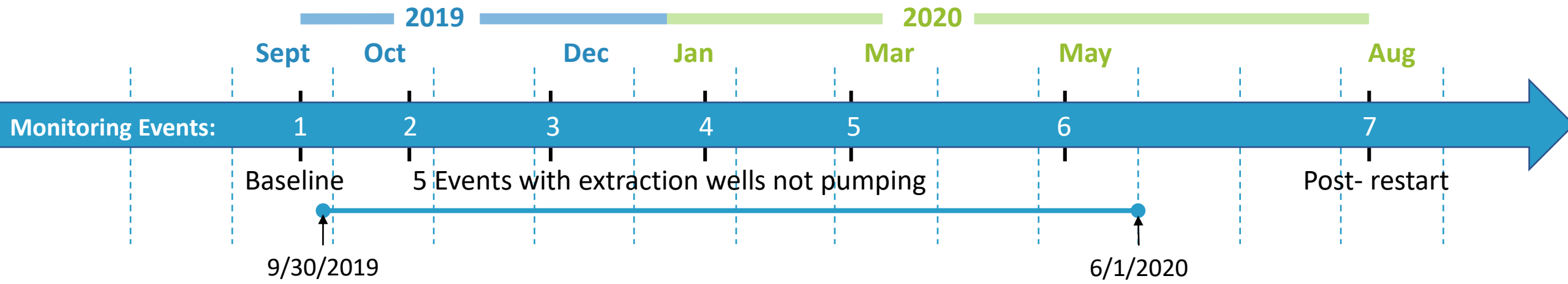
- Water soluble treatments applied underground
- Reactions occur underground
- Arsenic captured on soil
- Hydrocarbons degraded

Pilot Test: Pre-Pilot Groundwater Monitoring

- **Pilot proposed with existing groundwater extraction system off**
- **Pre-pilot monitoring evaluated natural groundwater conditions**



Pilot Test: Pre-Pilot Groundwater Monitoring



Groundwater level measurements

In-Field measurements

Laboratory Analyses

Pilot Test: Pre-Pilot Groundwater Monitoring

Approach

- 7 Events (Sept 2019 to Aug 2020)
  - 1 Baseline
  - 5 Shut off (Oct-May; 8 months)
  - 1 Post-Restart (72 days after restart)
- 45 Sampling Locations
  - 40 Wells/PZs & 5 surface water
- Monitoring Parameters:
  - Arsenic
  - Naphthalene
  - 2-Methylnaphthalene
  - Dieldrin
  - Lindane
  - Heptachlor Epoxide

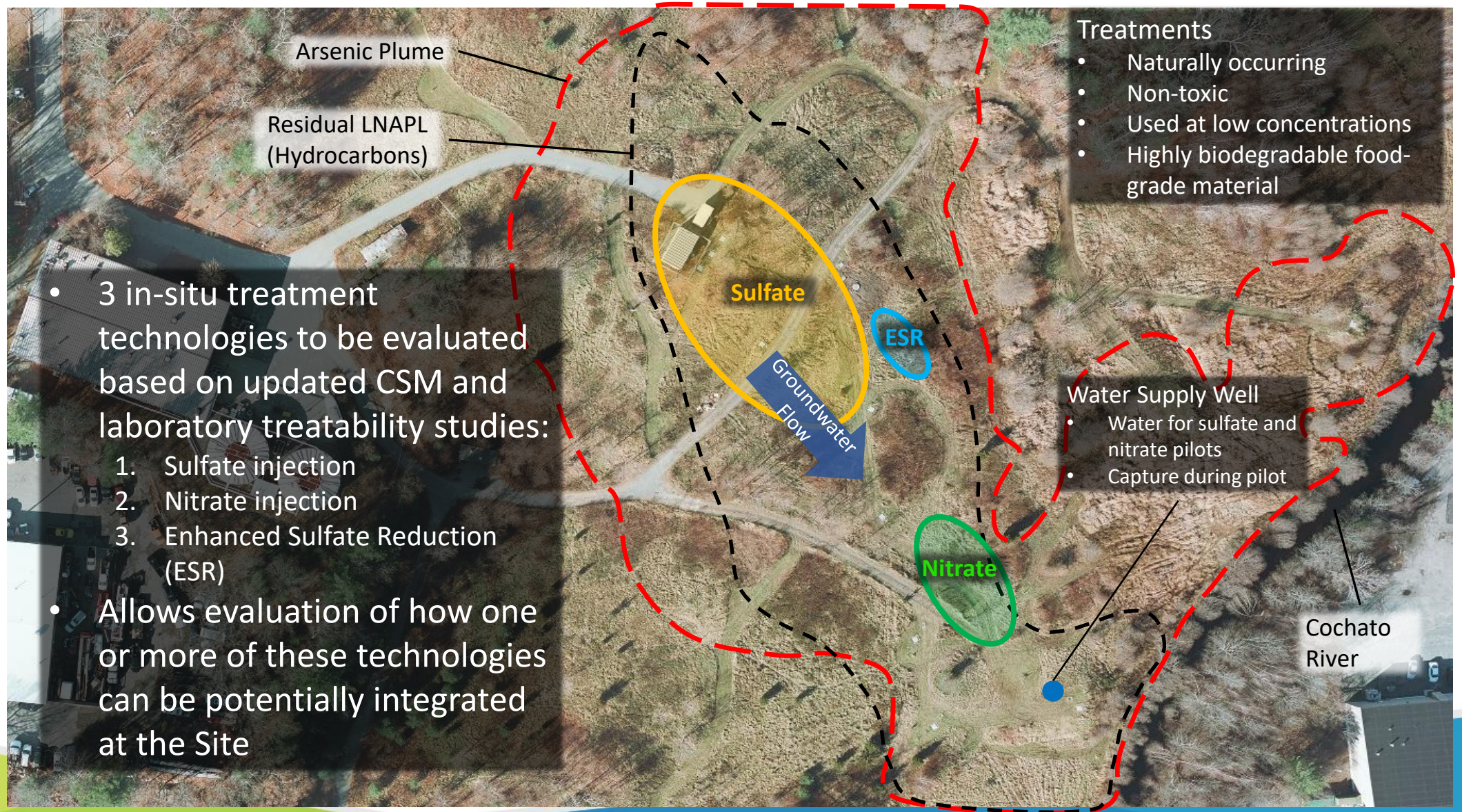
Results

- No exceedances of surface water quality standards
- Low numbers of detections in Cochato River surface water (14 / 210), including during baseline and with extraction wells pumping.
- Confirmed key components of the CSM, including:
  - Current source of arsenic and petroleum hydrocarbons to groundwater is in upgradient sands

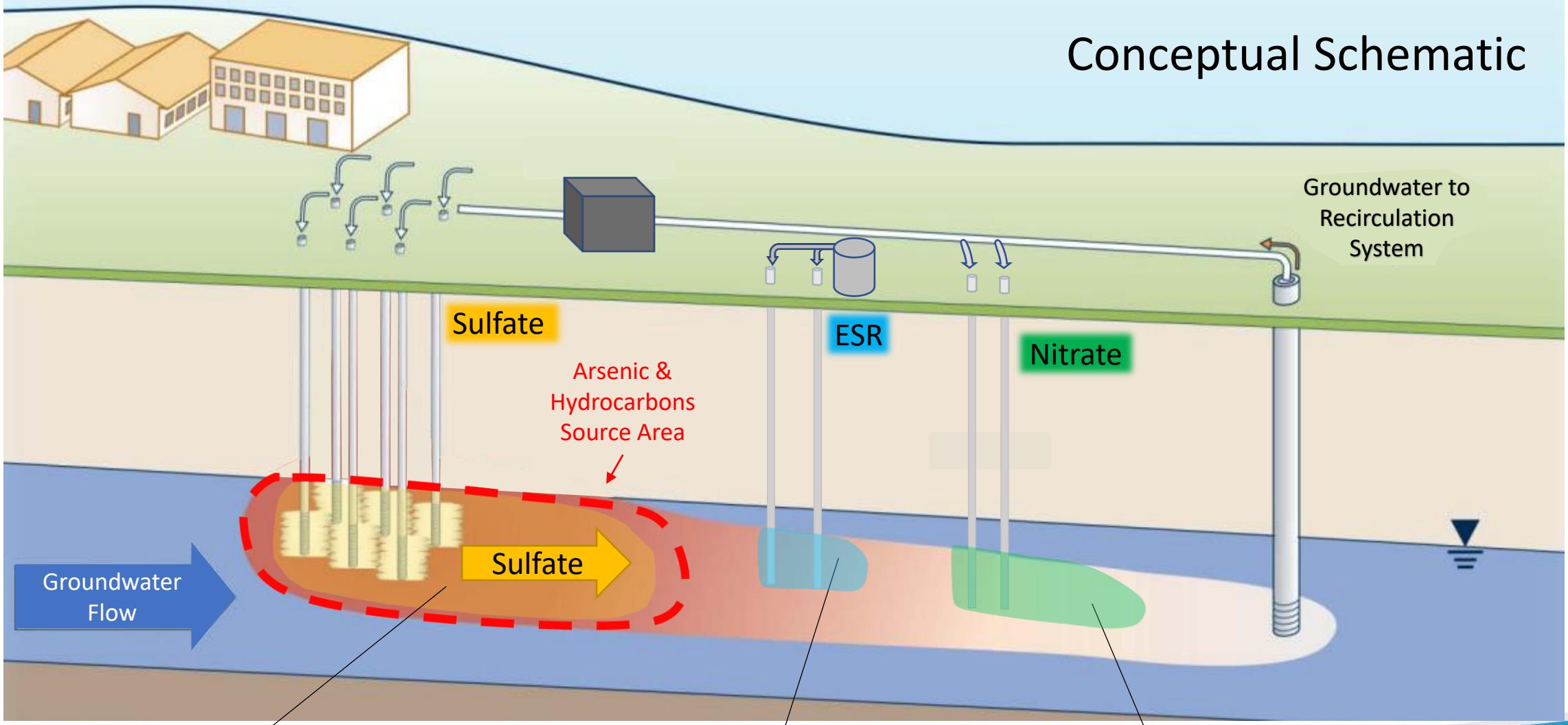
Pilot Test: Pre-Pilot Groundwater Monitoring Take-Aways

- **Shutting the extraction system off for 8-months did not adversely impact the quality of water in the Cochato River or groundwater under the river**
- **Contaminants were generally not detected in Cochato River water, or were detected at trace concentrations far below surface water quality standards**
- **The groundwater extraction and treatment system can be shut off during a planned pilot test without adversely impacting the quality of the water in the Cochato River**
- **Results provide a pre-pilot data set to compare with pilot results**

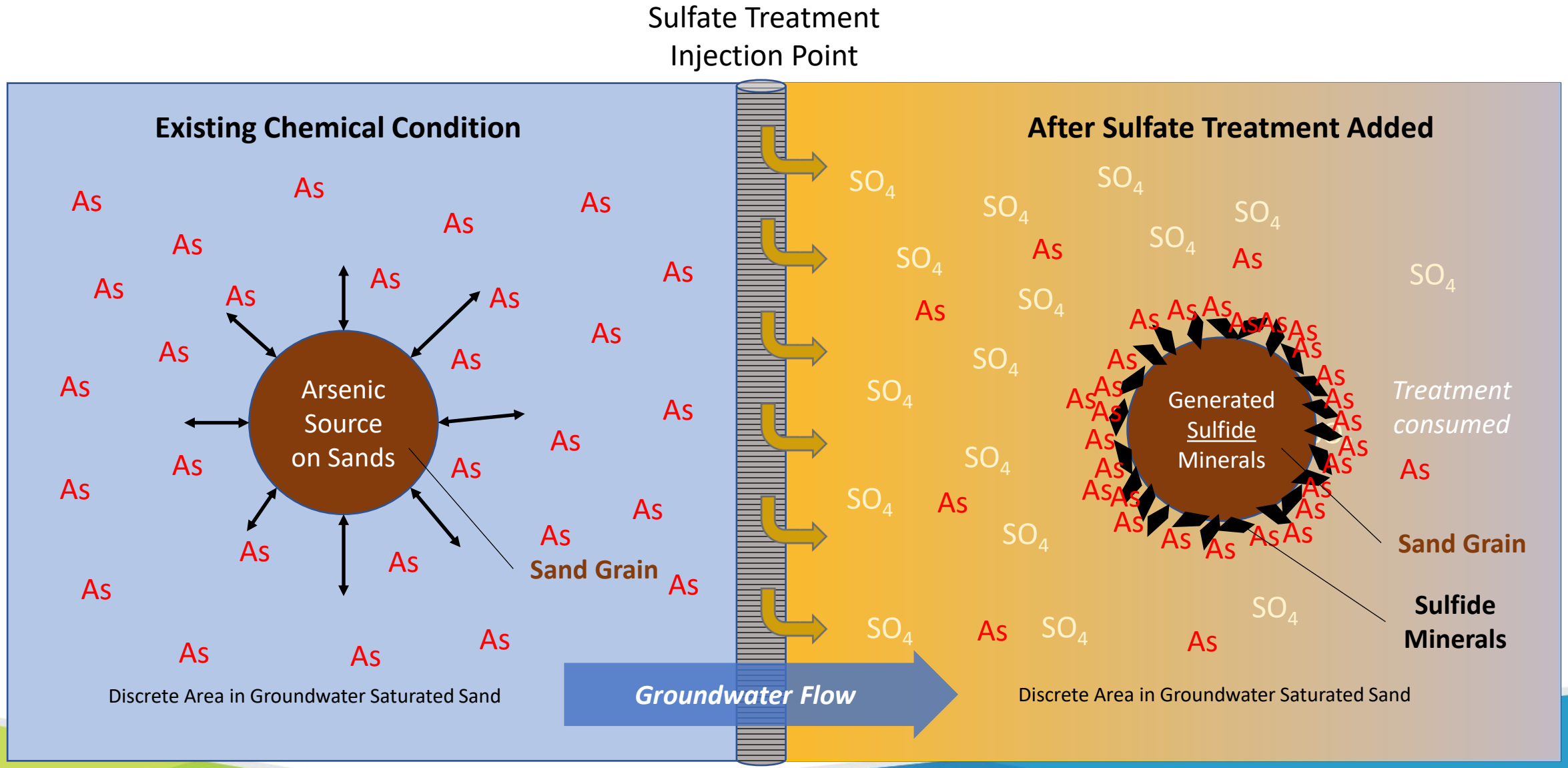
Pilot Test: Pilot Test Locations



Pilot Test: Proposed Pilot Technologies

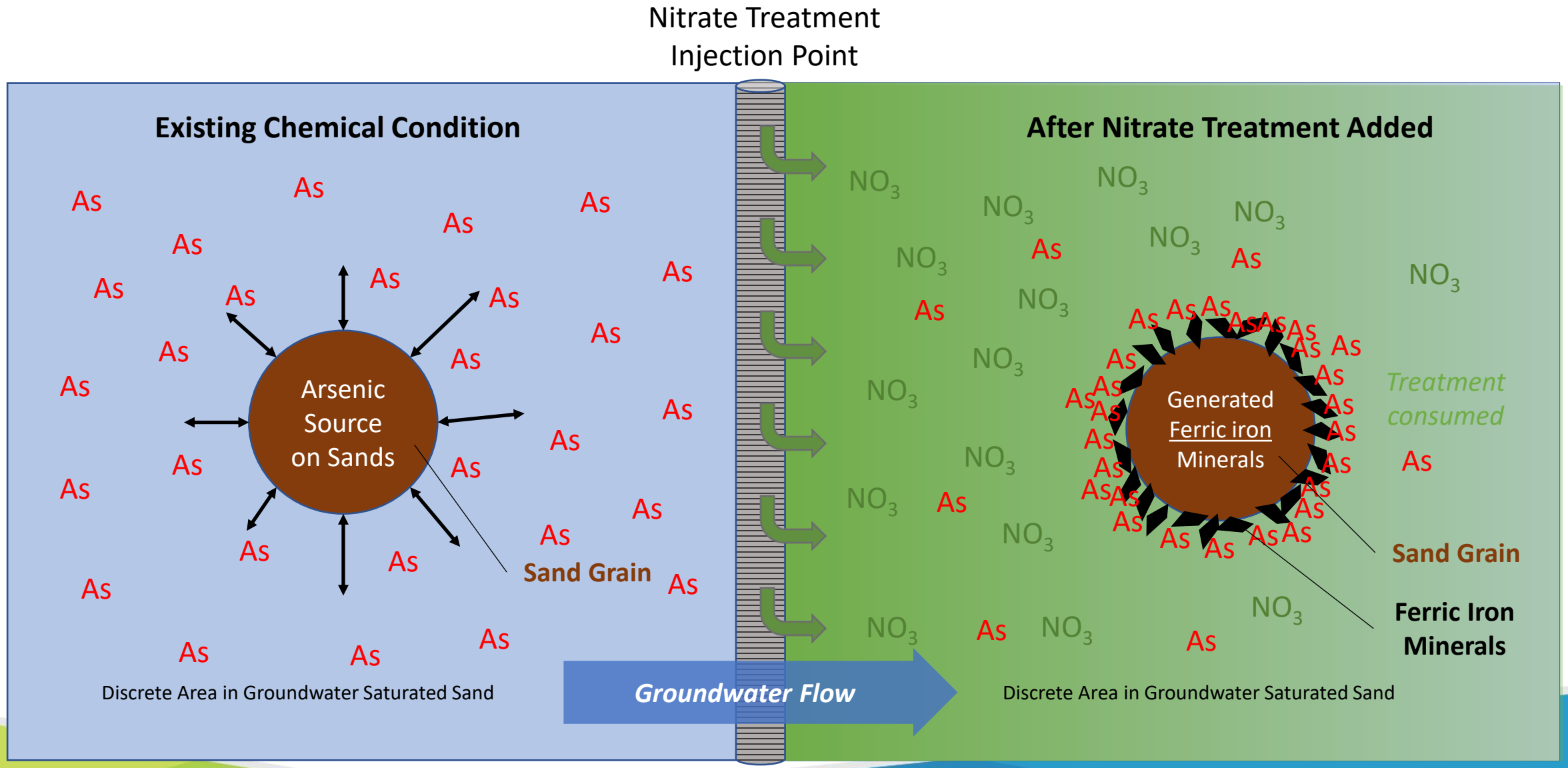


Pilot Test: Arsenic Treatment Process in Groundwater



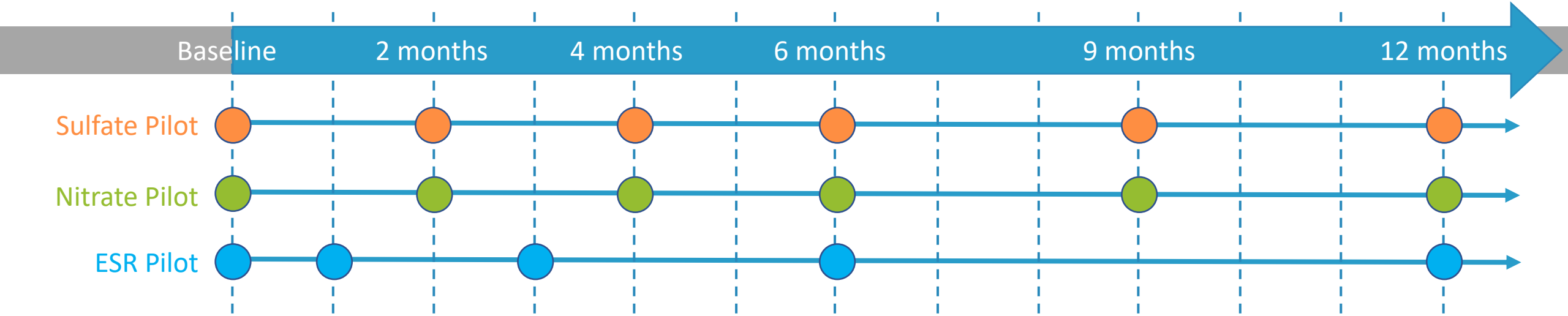
As – Arsenic
SO_4 – Sulfate

Pilot Test: Arsenic Treatment Process in Groundwater



As – Arsenic
NO_3 – Nitrate

Pilot Test: Pilot Test Monitoring Program

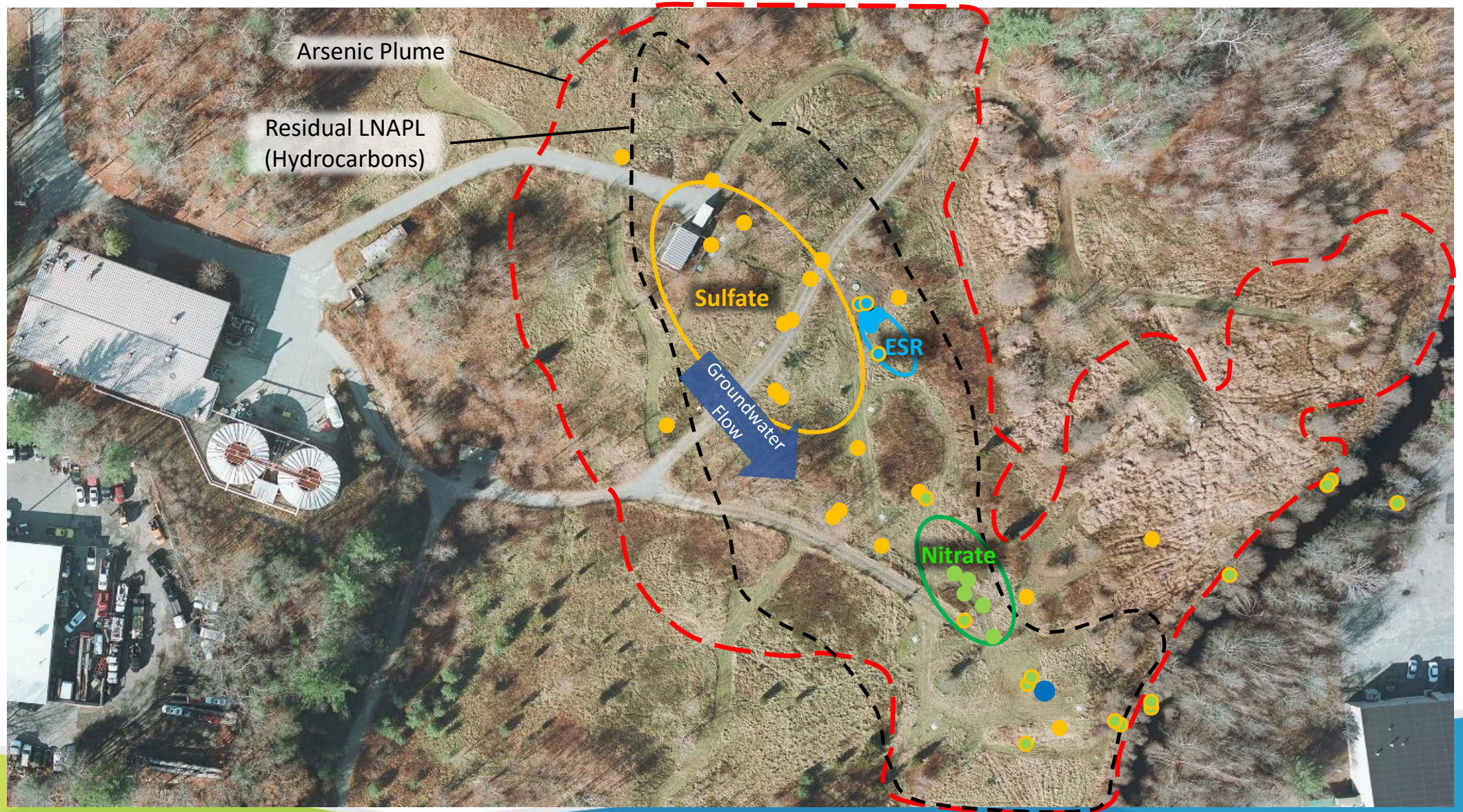


Groundwater level measurements

In-Field measurements

Laboratory Analyses

Pilot Test: Pilot Test Monitoring Locations



Pilot Test: Protection of Cochato River

- **Treatments fit in at least one the following categories:**
  - Naturally occurring
  - Non-toxic
  - Used at low concentrations
  - Highly biodegradable food-grade material
- **Monitoring during pilot**
- **Monitoring results with system off showed arsenic and hydrocarbons will not adversely impact the river water during pilot**
- **Groundwater containment component during pilot**

Pilot Test: The good news is…

- **The CSM tells us that the source of arsenic and hydrocarbons is in the saturated sands and if we do not treat it, we will be pumping for an estimated 100+ years.**
- **The CSM and Treatability Study tell us the groundwater treatment can be improved.**
- **We have 3 very promising technologies to pilot test in the field starting Spring 2021.**

Next Steps

- **Review data from pilot test** *(small-scale preliminary study)*
  - Through out the operations - estimated 12 months
    - to ensure that river has not been impacted
  - At completion
    - to review the overall effectiveness
    - to determine the best solution to improve the groundwater treatment
- **Restart the treatment plant after pilot test**
- **Continue to engage the community**
  - Get community input if groundwater treatment will change
    - Public meeting
  - Update / amend the community involvement plan
  - Frequently Asked Questions (FAQs) will be available on EPA's website

Question & Answer

Q&A: How to Participate Via Zoom

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More about the Site & other Site documents:
www.epa.gov/superfund/baird